

Remarks/Arguments:

Claims 1-56 are pending. Claims 1-56 stand rejected.

As a preliminary matter, applicants note that the Information Disclosure Statement filed on May 22, 2003 has not been acknowledged by the Examiner. Applicants respectfully request that acknowledgement of the IDS be provided with the next official action.

Rejections Under 35 U.S.C. 103

The Office Action at page 2, paragraph 4, sets forth "claims 1-8, 11-12, 14/11, 14/12, 17-49 and 52-56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stewart et al. (Intra-Cavity and Ring-down Cavity absorption with Fibre Amplifier for Trace Gas Detection) in view of Fischer et al (5,168,156)." Applicants respectfully traverse this rejection for the reasons set forth below.

Applicants' invention, as recited in claim 1, includes features which are neither disclosed nor suggested by either Stewart or Fischer, namely:

...a passive fiber optic ring having a portion thereof exposed to the sample gas or sample liquid...

...coupling means for i) introducing a portion of the radiation emitted by the coherent source to the passive fiber optic ring and ii) receiving a portion of the radiation resonant in the passive fiber optic ring... (emphasis added)

These features are described in Applicants' specification, for example, at page 4, lines 3-17.

Applicants' claimed invention is an apparatus for detection and measurement of trace species in at least one of a sample gas and a sample liquid. The apparatus comprises a passive fiber optic ring in which a portion of the passive fiber optic ring is exposed to a sample liquid or sample gas. Additionally, a portion of coherent radiation is coupled into the passive fiber optic ring with a portion of the radiation being resonant within the passive fiber optic ring.

Stewart is relied on as purportedly disclosing "a passive fiber optic system for both intra-cavity and ring down absorption measurements in trace gas detection (abstract) comprises a fiber optic ring (figure 1) having a micro-optic cell thereof exposed to the sample gas or liquid...coupling means (figure 1 and page 448, second paragraph) for introducing a portion of the radiation emitted by the coherent source to the passive optic ring and receiving a portion of the radiation resonant in the passive optic ring..." Applicants note that, although the Office Action construes the Stewart reference as a passive fiber optic ring, the fiber optic element is neither passive nor a ring. Rather, and is clearly shown in figure 1 of the Stewart reference, the fiber optic element is a continuous open ended length of fiber in which a portion of the fiber is folded back on itself through a coupler that necessarily introduces losses. Further, the erbium-doped region of the fiber acts like an amplifier rather than a passive element. This is evident not only from figure 1 but also from the title of the invention ("... absorption with fibre amplifiers ...") as well as the description of figure 1 on page 449 of the Stewart reference. Amplifiers are problematic in that they introduce noise in systems and introduce instability in ring-down times.

In contrast, Applicants' invention as recited in claim 1 is a passive fiber optic ring into which a portion of radiation emitted by the coherent source of radiation is coupled and from which a portion of the radiation resonant within the passive fiber optic ring is received. Further, the Office Action readily admits that "Stewart et al does not teach that passive fiber optic ring having a portion thereof exposed to the sample or gas." To make up for this acknowledged deficiency, however, the Fischer reference is relied upon as disclosing "a reflective evanescent fiber-optic chemical sensor in which a portion (14) of the optical fiber (20) exposed to the sample liquid." Applicants note that the Fischer reference at column 4, line 48, counts among its advantages the lack of a fiber loop. Specifically, the text of Fisher sets forth "It should be noted that another advantage of the sensor 12 is that ... no fiber optic loop is required ..." Accordingly, Fischer teaches away from the combination relied upon in the Office Action. "A reference may be said to teach away when a person of ordinary skill, upon reading the reference, would be discouraged

from following the path set out in the reference, or would be led in a direction divergent from the path that was taken by the applicant".¹

In further support of the above arguments, Applicants respectfully provide the enclosed Declaration Under 37 C.F.R. § 1.132.

Accordingly, Applicants respectfully submit that the rejection of claim 1 under 35 U.S.C. 103(a) as being unpatentable over Stewart et al. in view of Fischer et al. should be withdrawn and the claim allowed.

Although not identical, independent claims 48 and 53 recite features similar to those of claim 1 and, thus, are likewise not subject to rejection for at least the reasons set forth above with respect to claim 1.

Additionally, claims 2-8, 11-12, 14/11, 14/12, 17-47, 49, 52 and 54-56 depend upon either independent claim 1, 48 or 53 and, thus, are likewise not subject to rejection for at least the reasons set forth above with respect to the independent claims. Applicants respectfully request, therefore, that the rejection of claims 2-8, 11-12, 14/11, 14/12, 17-47, 49, 52 and 54-56 under 35 U.S.C. § 103(a) as being unpatentable over the combination of Stewart and Fischer be withdrawn and the claims allowed.

The Office Action at page 5, paragraph 5, sets forth "claims 9-10, 13, 14/13, 15, 16 and 50-51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Stewart et al and Fischer et al...and further in view of Lehmann (5,528,040)." Applicants respectfully traverse this rejection of the reasons set forth below.

The Office Action readily admits that the Stewart reference does not disclose an optical parametric generator, but relies on Lehmann as teaching "the use of an optical parametric generator (figure 1) for trace species detection." Lehmann does not disclose or suggest, however, a passive fiber optic ring for the purpose of detection and measurement of trace species in at least one of a sample liquid or gas. Thus, Lehmann does not make up for the deficiencies of the Stewart and Fischer references discussed above.

¹ In re Gurley, 31 USPQ2d 1130 (Fed. Cir. 1994) citing In re Sponnoble, 405 F.2d 578, 587, 160 USPQ 237, 244 (CCPA 1969).

Accordingly, Applicants respectfully submit that the combination of Stewart, Fischer and Lehmann alone or in any combination neither disclose, teach or suggest the features of claims 9-10, 13, 14/13, 15, 16 and 50-51. Thus, Applicants respectfully request that the rejection of these claims under 35 U.S.C. 103(a) as being unpatentable over the combination of Stewart et al., Fischer et al. and Lehmann be withdrawn and the claims allowed.

In view of the remarks set forth above, Applicants submit that the above-identified application is in condition for allowance which action is respectfully requested.

Respectfully submitted,

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Enclosure: Declaration Under 37 C.F.R. 1.132

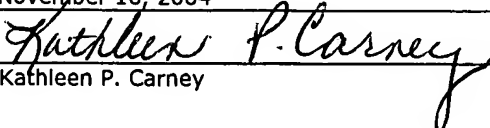
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November 16, 2004



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